NATIONAL PARK SERVICE
GREAT SMOKY MOUNTAINS NATIONAL PARK
BRIEFING STATEMENT
December 2001

Split view of Gregory Bald from Look Rock Observation Tower. On the left, natural annual visibility of 113 miles—which occurs less than 1% of the time. On the right shows current annual average visibility of 25 miles which occurs 40-60% of the time. Summer average visibility is 15 miles, but should be 77 miles. Real-time web-cam views, air quality data, and weather information are available on line at: http://www.nature.nps.gov/ard/parks/grsm/lookRockWeather.htm

Subject: Air Quality Issues and Class I Area Responsibilities

Problem/Issues: Monitoring and research conducted over the past 20 years in Great Smoky Mountains National Park (GRSM) has shown that airborne pollutants emitted outside the Park and transported into the Park, are significantly impacting Park resources (streams, soils, vegetation and visibility), visitor enjoyment and public health. The burning of fossil fuels (e.g. coal, oil, and gas) produces emissions of sulfur dioxide and nitrogen oxides that convert into harmful secondary pollutants (e.g. sulfates, nitrates and ozone). Winds coming into the southern Appalachian Mountains carry pollutants from as far away as the Tennessee, Ohio, and Mississippi River valleys, the industrial cities of the Southeast and Midwest, the Gulf States and the Northeast. The height and physical structure of the mountains, combined with predominant weather patterns, tend to trap and concentrate air currents entering the southern Appalachians.

Clean Air Act Requirements: Congress passed the Clean Air Act (Act) in 1970, establishing national policy toward preserving, protecting, and enhancing air quality. The 1977 Clean Air Act Amendments designated all national parks that exceeded 6,000 acres in size as mandatory Class I areas worthy of the greatest degree of air quality protection under the Act. The 1990 Amendments to the Act left intact the requirements for Class I area protection, while providing additional tools to accomplish the protection. Under the Act, the federal land manager has been given the affirmative responsibility to assure that air quality and the air quality-related values in Class I areas, such as GRSM, do not deteriorate, and to take an aggressive role in protecting, preserving and enhancing the Park's resources.

Air Quality Issues – page 2

Visibility Impairment from Regional Haze: Visibility at GRSM has been seriously degraded over the last 50 years by human-made pollution. Since 1948, based on regional airport records, annual average visibility in the southern Appalachians has decreased 60% overall, 80% in summer, and 40% in winter. Summer used to have some of the best visibility, and now it has the worst. Tiny sulfate particles, from the transformation of sulfur dioxide emissions from burning coal by power plants, causes light to be scattered and is responsible for 73 percent of the chronic visibility impairment during the summer months. Increasingly, visitors are no longer seeing the sweeping mountain vistas because of this haze. Scenic views at GRSM are impaired by pollutants more than 90 percent of the time with haziness in the summer months so bad that on average, viewers can only see 15 miles, when they should be able to see 77 miles. During severe haze episodes, visibility has been reduced to less than one mile. Annual average visibility at GRSM is 25 miles when it should be about 113 miles. Declining visibility is well correlated with increasing emissions of sulfur dioxide. Fine particulate matter, summer sulfate concentrations, light extinction, and haziness have not decreased since 1988. In April of 1999, EPA promulgated the Regional Haze Rule that requires visibility in the Class I areas, including GRSM, to improve our haziest days to natural conditions by 2065 and to preserve the clearest days presently being experienced.

Ozone Pollution and Effects to Vegetation: Ground-level ozone (O_3) pollution, produced by the reaction of nitrogen oxides and volatile organic compounds in the presence of sunlight, is one of the most serious and pervasive air pollutants injuring vegetation at GRSM. Ozone exposures at GRSM are among the highest in the eastern U.S. and have exceeded the National Ambient Air Quality Standard (NAAQS) for the protection of public health. Since May 1998, the Park has exceeded the 8-hour ozone standard to protect public health on 142 different days. Ozone is transported long distances from large urban areas to rural forested areas like GRSM. On average, daily O_3 levels over the ridge-tops of the Park are up to two times higher than Knoxville or Atlanta levels. Since 1984, field surveys have identified 90 plant species that exhibit O_3-like foliar injury symptoms in the Park. Thirty species of plants that were exposed to O_3 under controlled conditions in fumigation chambers, showed foliar damage at O_3 levels that occur in the Park. To further quantify this injury, permanent vegetation monitoring plots and field surveys were conducted. In general, the higher the elevation, the more severe the O_3 concentrations and leaf injury. In especially sensitive species including black cherry and tall milkweed, the incidence of O_3 injury can be as high as 90 percent and is having overt affects to the vegetation of the Park. Ozone is also causing certain sensitive plant species to grow slower (e.g., yellow-poplar and black cherry).

Acid Deposition Impacts to Aquatic and Terrestrial Resources: The Park receives some of the highest deposition rates of sulfur and nitrogen of all monitored locations in North America. These pollutants are deposited in the form of, not only rainfall, but from large amounts of dry particles and cloud water. Annual wet nitrate deposition has increased 16 percent from 1981-2000 at GRSM. The annual average acidity (pH) of rainfall at the Park is 4.5, 10 times more acidic than natural rainfall pH (5.0-5.6). Cloud water acidity averages 3.5 pH and has been measured as low as 2.0 pH. Cloud-water concentrations of sulfate and nitrate have increased since 1994. Both long-term chronic and episodic acidification are adversely affecting sensitive streams and soils. Most high-elevation Park streams are highly sensitive to acidification with little ability to neutralize acids resulting from sulfur and nitrogen pollution. Certain high elevation Park streams have the highest nitrate levels of any systems in the U.S. draining undisturbed watersheds. Certain high elevation soils in the Park are experiencing advance stages of nitrogen saturation, causing leaching of forest nutrients like calcium and mobilizing toxic aluminum that can hurt vegetation (by inhibiting uptake of nutrients) as well as biota in streams.

Prevention of Significant Deterioration (PSD) and New Source Permitting Status: Under the Clean Air Act, the National Park Service is invited to comment on state air quality permit applications for proposed new facilities expected to emit over 100 tons per year of certain air pollutants (SO2, NOx, PM, VOC). Since 1980, the NPS has sent comments to the Tennessee Air Pollution Control Board on over 30 permit applications and related actions.

Those comments described the damage already being documented and recommended that any increases in pollution permitted be offset by reductions in pollutant output elsewhere, and that the best available control technology be used to minimize the amount of new pollution. In most cases, the permits were granted without fulfilling the Service's recommendations. In February 1992, the Assistant Secretary for Fish, Wildlife, and Parks published a preliminary notice in the Federal Register recommending that air pollution permitting bodies in five neighboring states not issue permits for new major pollution sources within 120 miles of the Park unless measures are taken to prevent increasing impacts on Park resources. Since 1998, permitting activity has increased in the region with many new smaller power plants and industries seeking permits near GRSM.

Permitting Procedures Agreement between Tennessee (TN), North Carolina (NC), Department of Interior (DOI) and Department of Agriculture (DOA): In 1995, the State of TN executed a Memorandum of Understanding (MOU) with the DOI as part of the settlement of an appeal of the state's granting a new source permit to Tenn-Luttrell Company. The MOU helped clarify and streamline the information-sharing process regarding proposed large new pollution sources. This first TN MOU was later rescinded by the State, but a second version was re-negotiated and became effective in June 1997. The second TN/DOI MOU contained a provision that would have allowed it to sunset in March 1999 unless a second Southern Appalachian Mountains Initiative state (see SAMI below) signed a similar agreement. Before the March deadline, NC Governor Hunt signed the agreement to establish formal permitting procedures between NC and the NPS for reviewing permit applications for new or expanded air pollution sources located near the Park in NC. North Carolina's agreement also contains a sunset clause with which the agreement will expire if a third SAMI State does not sign on. Negotiations with Georgia and other states are ongoing.

New EPA Public Health Standards for O3 and PM and Reduction Strategies for Ozone: Effective July 1997 the EPA promulgated revised NAAQS for ozone and particulate matter. The new ozone standard, designed to provide greater protection of public health, tightens the standard from the previous 0.12 parts per million (ppm) for a one-hour period to 0.08 ppm averaged over an eight-hour period. Under this new standard, the Park recorded 44 days of unhealthy levels of ozone in 1998. That year was the worst in the Park's history until 1999 when the Park experienced 52 exceedance days. Year 2000 has recorded 25 exceedances and 14 in 2001. Both Governors from TN and NC proposed to EPA that the Park be designated as non-attainment for the 8-hour ozone standard. Counties in non-attainment will likely be required by state and local regulatory programs to take measures to reduce emissions from stationary and mobile sources in order to lower their pollution levels. The EPA in October 1998 passed the NOx State Implementation Plan (SIP) call, which requires 22 eastern states to reduce their NOx emissions by approximately 30 percent by 2003. The EPA also documented power plant emission violations from several utilities (including TVA and Southern Company) and Department of Justice is taking legal enforcement action against them which could result in emission reductions and/or fines.

DOI Petition of EPA for Rule-Making to Protect Air Quality Related Values (AQRVs): Because of the serious air pollution problems at Great Smoky Mountains and Shenandoah National Parks, DOI has asked EPA to take more immediate actions to mitigate documented adverse impacts on park resources and reverse deteriorating air quality trends. Several northeastern states, citing similar air quality concerns, petitioned EPA to promulgate revised secondary national ambient air quality standards. The NPS met with EPA in September 2000 to review the concerns. EPA is still considering the proposal.

Mult-pollutant Strategy: A multi-pollutant reduction strategy for SO2, NOx, mercury, and CO2 is currently being negotiated by Congress and the Administration. This approach levels the playing field, creates equity and long-term certainty among the regualted community. It would require older power plants to install modern pollution control technology or otherwise comply with more stringent emission limits. Bills are currently pending in the House and Senate that would accomplish this objective.

Air Quality Issues - pg 4.

Several bills were introduced in 1999, including, the H.R. 2900 Waxman-Boehlert bill (requires a 75% reduction from 1997 levels of SO2 and NOx by 2005) and Jeffords bill in Senate (S. 1369) (similar reductions). These bills also require control of CO2 and mercury. In 2000, S. 172 was introduced by Moynihan, which would require a 50% reduction above and beyond reductions required by the acid deposition control program to improve sensitive ecosystems like the Smokies. Pending bills allow reductions to be achieved through trading programs and market mechanisms. Another approach would be to specifically require installation of SO2 scrubbers on all sources that did not control SO2 under the Clean Air Act Amendments of 1990 (Phase I done in 1995 and Phase II in 2000) and installation of selective catalytic reduction (SCR) control technology for NOx on all sources not covered by EPA's NOx SIP call. The Tennessee Valley Authority announced plans in Fall 2001, to begin this voluntarily by putting SO2 scrubbers on 3 of the closest power plants to the Park, which will reduce SO2 emissions by over 90 percent.

Southern Appalachian Mountains Initiative (SAMI): SAMI, established in 1992, is a voluntary, multi-organizational, state-driven initiative charged to remedy existing and to prevent future adverse effects of air pollution on the Southern Appalachians, primarily in Class I areas. SAMI plans on developing recommendations to the southeast governors to protect the Southern Appalachian Class I parks and wilderness areas by fall 2001. However, until the SAMI process is completed and effective regional solutions can be developed and adopted by SAMI states to achieve its mission, the NPS will continue to work with EPA and the states and act on individual permits to prevent the air pollution at GRSM from worsening. A representative from the NPS Southeast Regional Office is a non-voting member of the Governing Body of SAMI. The lack of an emissions offset requirement is also hindering the air quality protection efforts for GRSM. SAMI is to make recommendations over the next several month and conclude at the next Governor's Summit on Mountain Air Quality to be held in Charlotte, NC in Spring, 2002.

Service Position: New emissions permits should be granted only when "best available control technology" is planned and when offsets are implemented to prevent any net increase in pollutants. The NPS also supports the strictest possible state regulations on existing stationary and mobile sources and other emissions that contribute to the air pollution problems at GRSM.

Position of Major Constituents: The EPA, the USDA-Forest Service, Fish and Wildlife Service and several environmental groups support our position. The public generally supports preserving the Park, but some are concerned that limiting emissions might limit economic growth. Most southeastern states have acknowledged that damage is occurring to Park resources at GRSM but few have agreed to act upon our recommendations to significantly lower and control emissions. The southern states at this time do not require new emissions to be offset, unless the source is impacting an area that is exceeding the NAAQS.

Action Required: Continue to work with state and local regulatory programs, the EPA, environmental groups, and industrial interests in developing a comprehensive plan to remedy existing impacts and prevent future damage through such measures as offset programs, use of improved technology, setting state emission caps for various pollutants, cleaner and renewable energies, PSD, SIP, and ultimately reducing sulfur dioxide and nitrogen oxides pollution to levels that protect AQRVs.

Program Contacts: Michael Tollefson, Superintendent, Great Smoky Mountains National Park, 865/436-1201. email: grsm_superintendent@nps.gov or Jim Renfro, Air Quality Specialist, Great Smoky ountains National Park, 865/436-1708. email: jim_renfro@nps.gov